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and all the nontoxic cultures remaining nontoxic at the end of the experiment. The results suggest the possibility of the transformation of toxic cultures of other toxin-producing anaerobes, such as the organisms of tetanus and of botulism, Types A and B, into nontoxic types.

MOSQUITO CONTROL AT TRINIDAD ASPHALT LAKE, BRITISH WEST INDIES.

According to reports made by the American consul at Trinidad, British West Indies, one of the most serious difficulties in the production of asphalt at the famous Trinidad Lake, and also with petroleum developments in the immediate vicinity, has been the high incidence of malaria. Conditions at the lake are extremely favorable for mosquito breeding. The asphalt lake is about 20 feet below the level of the surrounding ground surface, and is gradually being lowered by the mining operations, affording a natural catchment area for rain water, accumulations of which are found between the mound-shaped masses of asphalt on the lake and in "pitch holes," "pitch cones," and grassy bottomed pools and drains adjacent to the lake.

It has been found difficult both to drain off the water and to fill up the water holes. Ordinary dug drains are soon refilled by the slowly moving currents of asphalt; and if holes are filled, the material is soon drawn down underneath the surface. Electrically driven pumps are used to pump off water that is drained into a sump at one edge of the lake. These drains connect with the pits from which the asphalt is taken, but within a few days they close in and become flush with the surface of the lake.

During the dry season, from February to May, the ordinary roadside drains in the country about the lake tend to dry up, but breeding places for mosquitoes are perpetuated in pitch holes and seepages, a large number of which are found within a mile of the lake. Sometimes a "pitch cone" will develop within a few hours, and, expanding under the pressure of gas, finally bursts, leaving a depression which holds water.

Owing to the heretofore ineffectual drainage, about the only check to mosquito propagation has been that resulting from the presence of several varieties of larvæ-eating fish which are found in large numbers in the water holes. For a number of years a large asphalt company operating at the lake has made serious attempt at mosquito control, adopting remedial measures that seemed practicable, including drains to carry off the rainfall, the spraying of pools with crude oil, keeping the brush and grass cut, and screening the bungalows of the employees. In 1919 the company placed a medical officer in charge of mosquito-control work in the district under the company's jurisdiction. All drains were cleaned of vegetation as far as possible; but it was found that the work of keeping the drains in good condition was expensive, owing to the luxuriant growth of vegetation during the rainy season and the scouring action of the tropical rains, eroding the sides and bottoms of the drains. Crude-oil spray was used on pools, but was not found satisfactory as the film was broken up by the wind and rainfall.

Finally an ingenious and successful method was devised of lining the sides and bottoms of the drains in a manner that prevented the growth of vegetation and resisted the scouring action of the heavy rains. The method was as follows:

The drain was cleaned of vegetable matter, and liquid asphalt was poured on the sides and bottom. Sand was then sifted over the asphalt, about 1 cubic foot to 8 square yards. A piece of oily waste was placed at one end of the drain and ignited. Oil was then sprayed on by means of a hand pump as the fire spread along the course of the drain, the liquid asphalt burning with intense heat. The heating of the liquid asphalt and sand to a high temperature gave a hard asphalt wearing surface on the sides and bottom of the drain.

The work of lining the drains is done during the dry season.

The approximate cost of lining is 14½ to 20 cents per square yard.

The benefits derived from the drains made by the improved method are shown in the great reduction in the malaria rate, which dropped, in the districts in which the work was done, from 798 per 1,000 employees in 1920 to 265 in 1921. In the village of La Brea, over which the asphalt company has no control, the malaria case rate was 602 in 1920 and 590 in 1921, a slight reduction in 1921, which may or may not have resulted from the work done in the other localities.

MALARIA INCIDENCE AMONG THE EMPLOYEES OF THE PANAMA CANAL.

In view of the fact that there have appeared recently in the public press, inaccurate statements regarding the incidence of malaria among the employees of the Panama Canal, there is printed below a table giving the monthly incidence rates for the years 1918–1921, and for January to July, 1922. The data were furnished by the chief quarantine officer of the Panama Canal.